City of Wilmington Pedestrian Safety Study

Pedestrian Crash Data Review

September 2021

DelDOT

WRA

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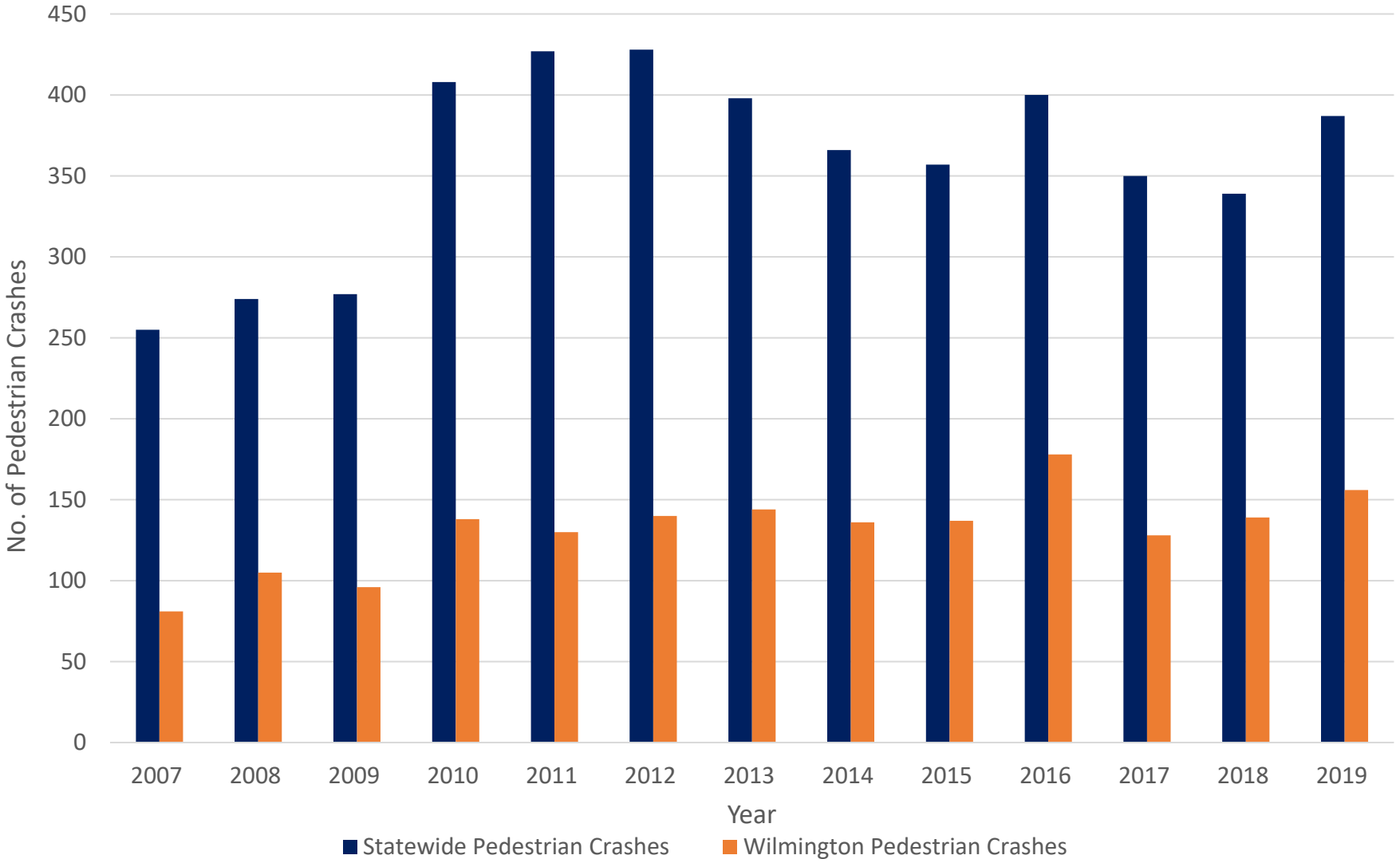
STATEWIDE PEDESTRIAN CRASH STATISTICS

Pedestrian Crashes Statewide

37% of statewide pedestrian crashes from 2007-2019 have occurred in the City of Wilmington



Sources: Statewide Pedestrian Crashes: DSP Annual Traffic Statistical Reports
Wilmington Crashes: CARS

DE Pedestrian Fatalities vs. Region

Pedestrian fatalities per 100k population	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Delaware	**1.85**	**2.41**	**1.69**	**2.45**	**1.98**	**2.94**	**2.70**	**2.67**	**3.70**	**2.84**	**3.43**	**2.38**
D.C.	3.23	1.52	2.33	2.15	1.29	1.11	1.39	1.37	1.93	1.17	1.59	1.57
Maryland	2.06	2.06	1.98	1.75	1.75	1.63	1.82	1.69	1.53	1.73	1.88	2.12
Pennsylvania	1.21	1.10	1.06	1.14	1.15	1.28	1.15	1.26	1.18	1.32	1.15	1.54
Virginia	1.14	0.98	0.93	0.91	0.90	1.20	0.91	1.06	0.92	1.45	1.31	1.39
West Virginia	1.49	0.72	1.15	0.70	1.08	1.67	1.51	1.03	1.03	1.31	1.43	1.22
Max. State Rate/Yr	3.23 (DC)	2.67 (FL)	2.51 (FL)	**2.45 (DE)**	2.57 (FL)	**2.94 (DE)**	**2.70 (DE)**	3.55 (NM)	**3.70 (DE)**	3.51 (NM)	3.54 (NM)	3.96 (NM)
Min. State Rate/Yr.	0.38 (WY)	0.28 (NE)	0.37 (WY)	0.44 (NE)	0.38 (NE)	0.24 (SD)	0.14 (ND)	0.48 (NE)	1.48 (ID)	0.63 (NE)	0.66 (ND)	0.52 (ME)

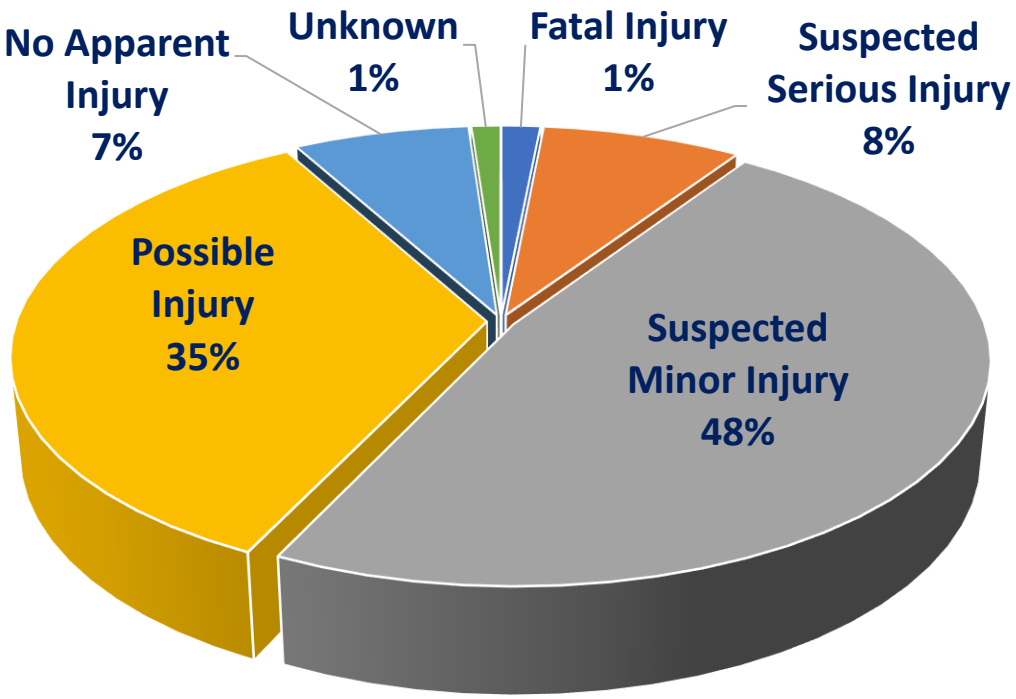
States in NHTSA's Region 3

Source: National Highway Traffic Safety Administration (NHTSA)

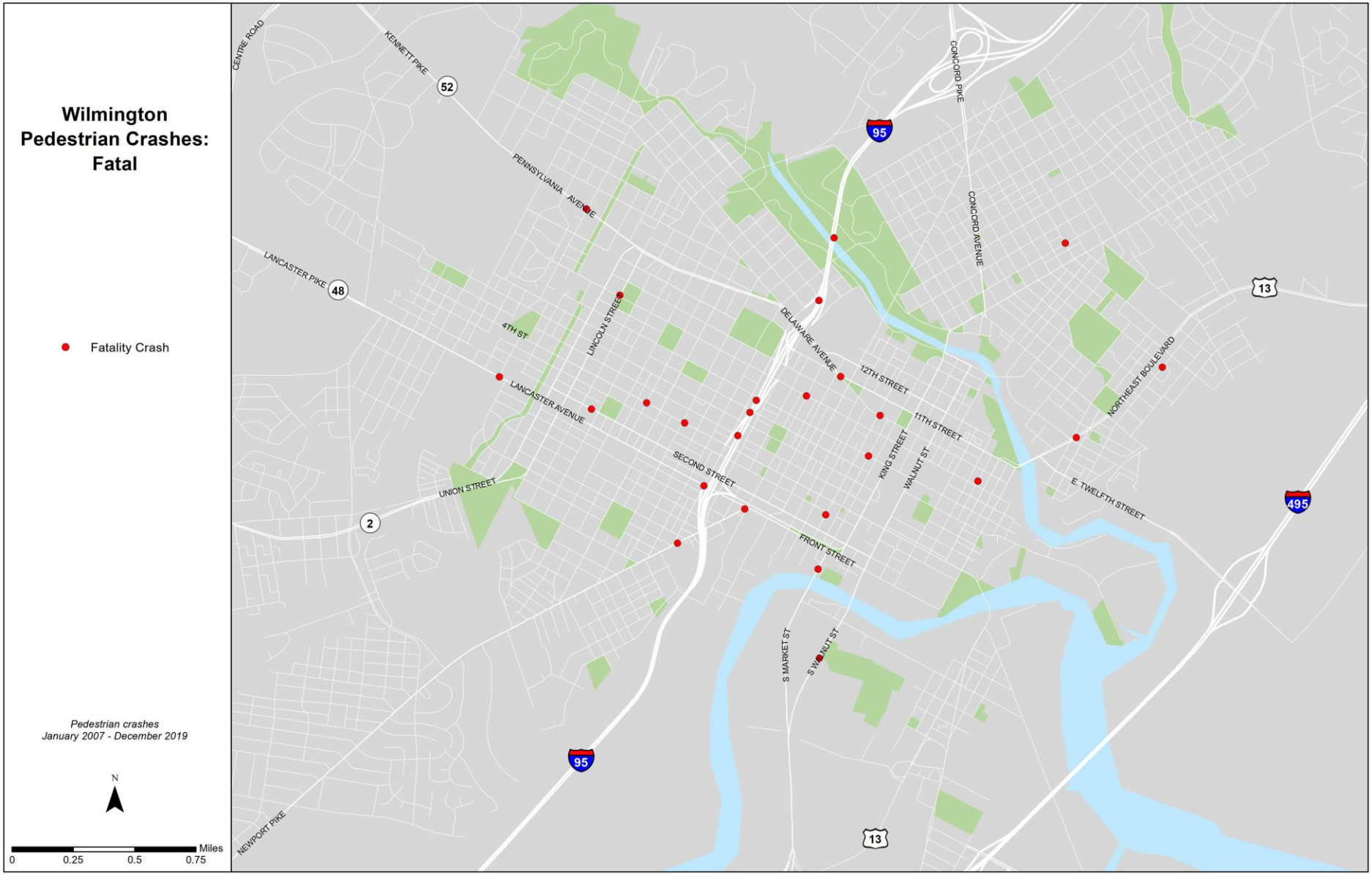
WILMINGTON PEDESTRIAN CRASH STATISTICS

Wilmington Pedestrian Crash Statistics

- Jan. 1, 2007 – Dec. 31, 2019
- Source: DelDOT's CARS Program
- All crash severities
  - Property Damage Only
  - Injury
  - Fatal
- Overall crash statistics
  - 1,494 pedestrian crashes
  - 1,572 pedestrians involved
  - 24 pedestrians killed
  - 124 pedestrians seriously injured
  - 750 pedestrians with minor injuries
  - 547 pedestrians with possible injuries



Pedestrian Crashes – Where?



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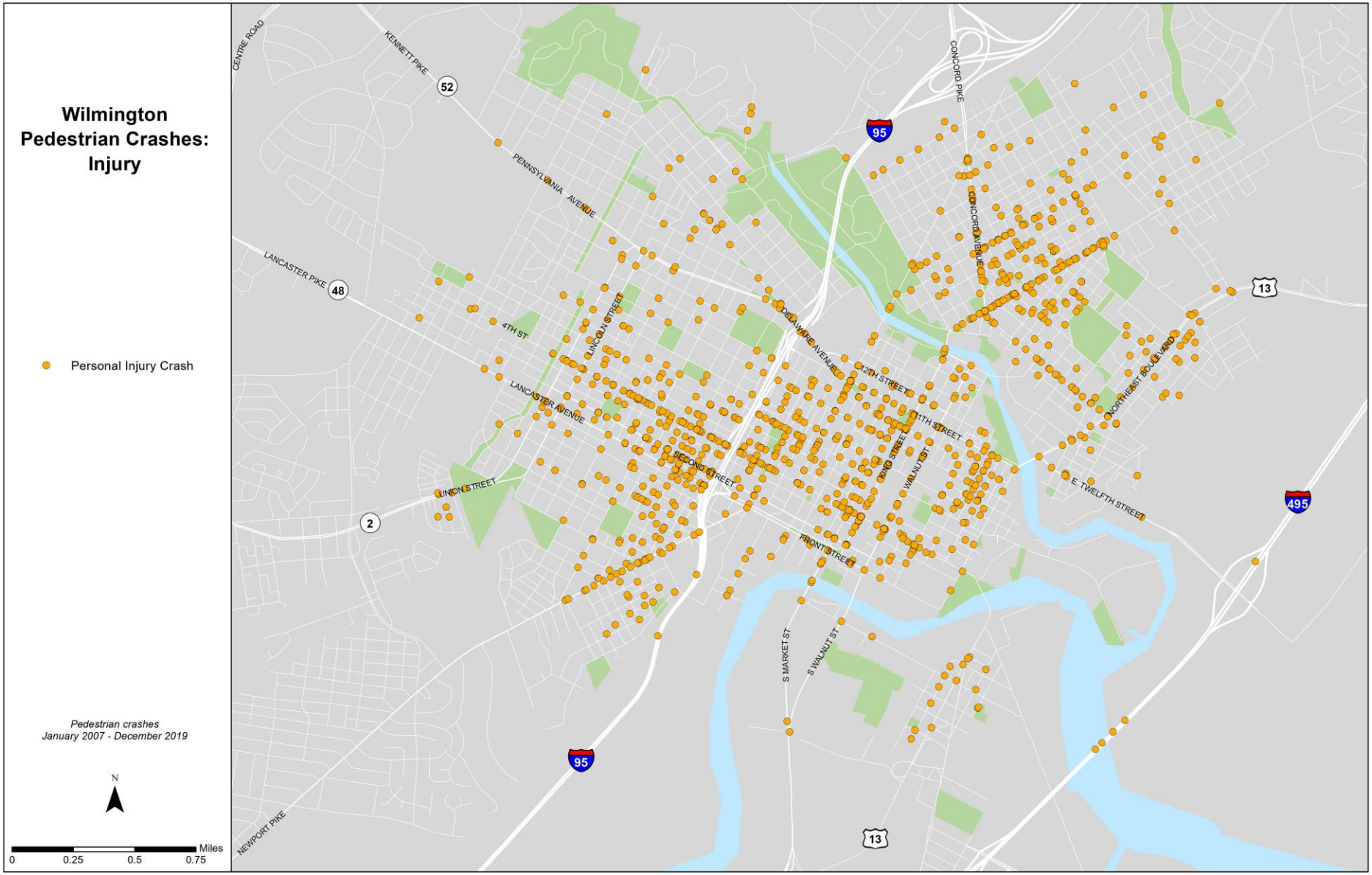

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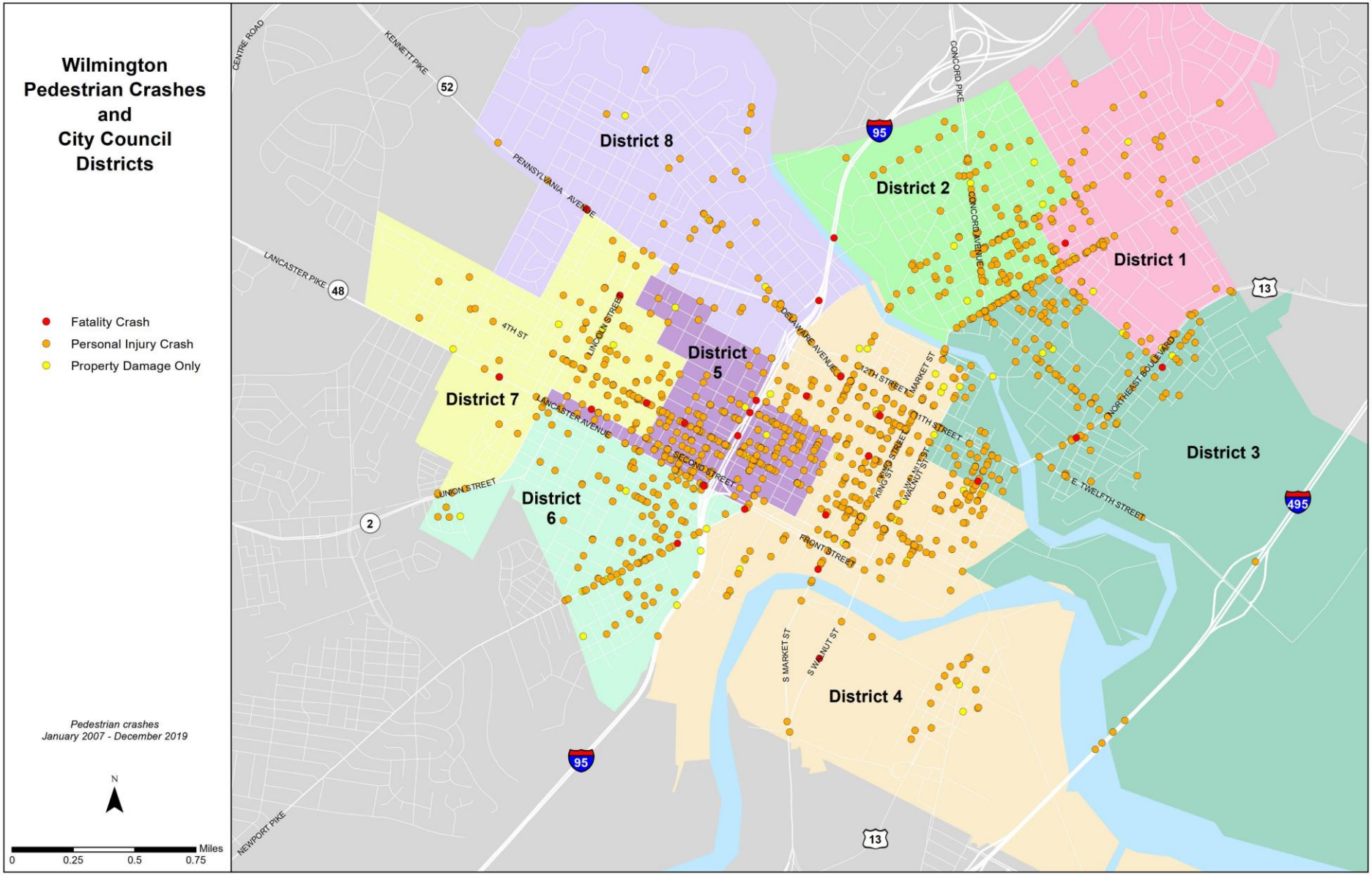

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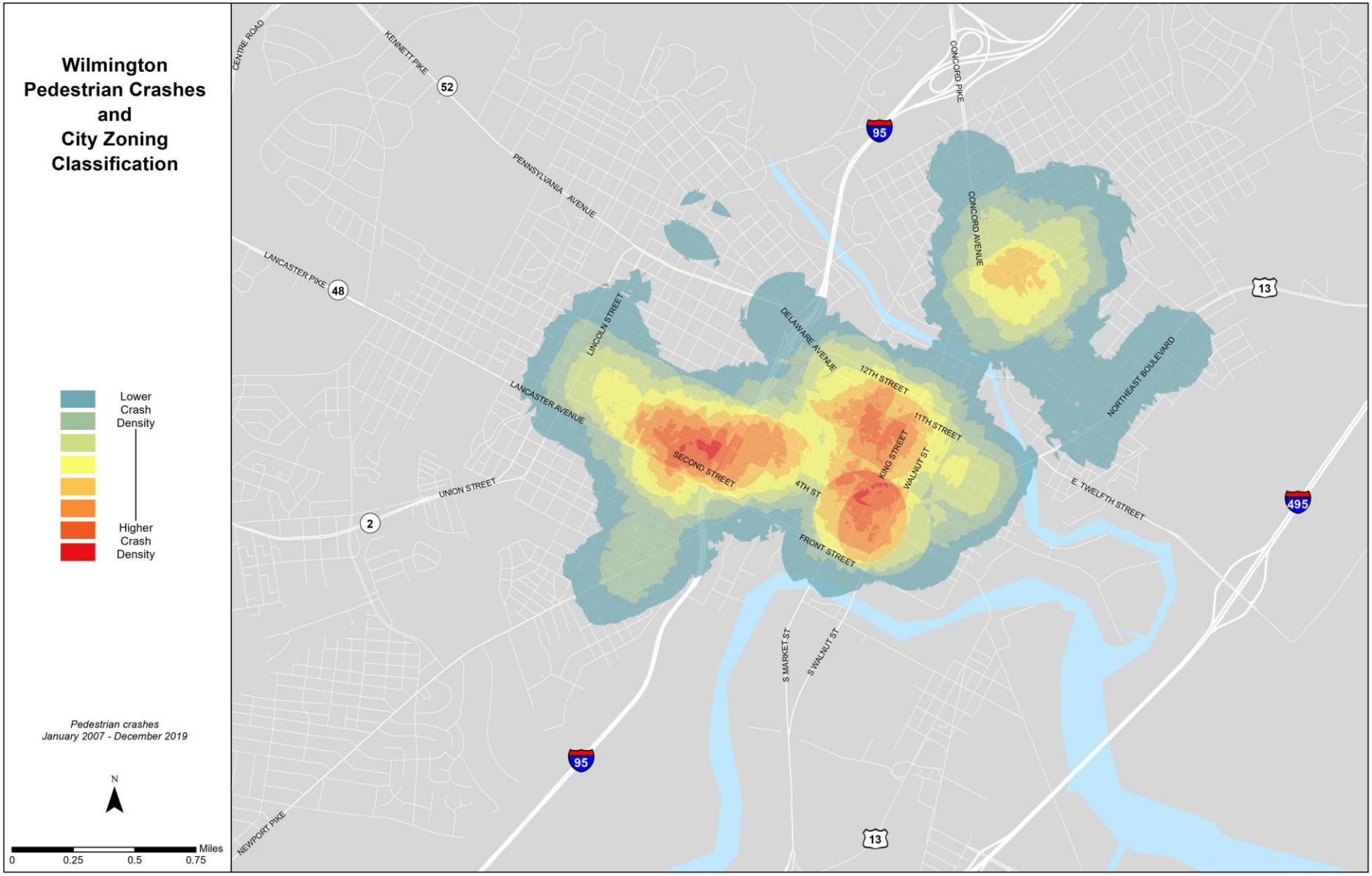

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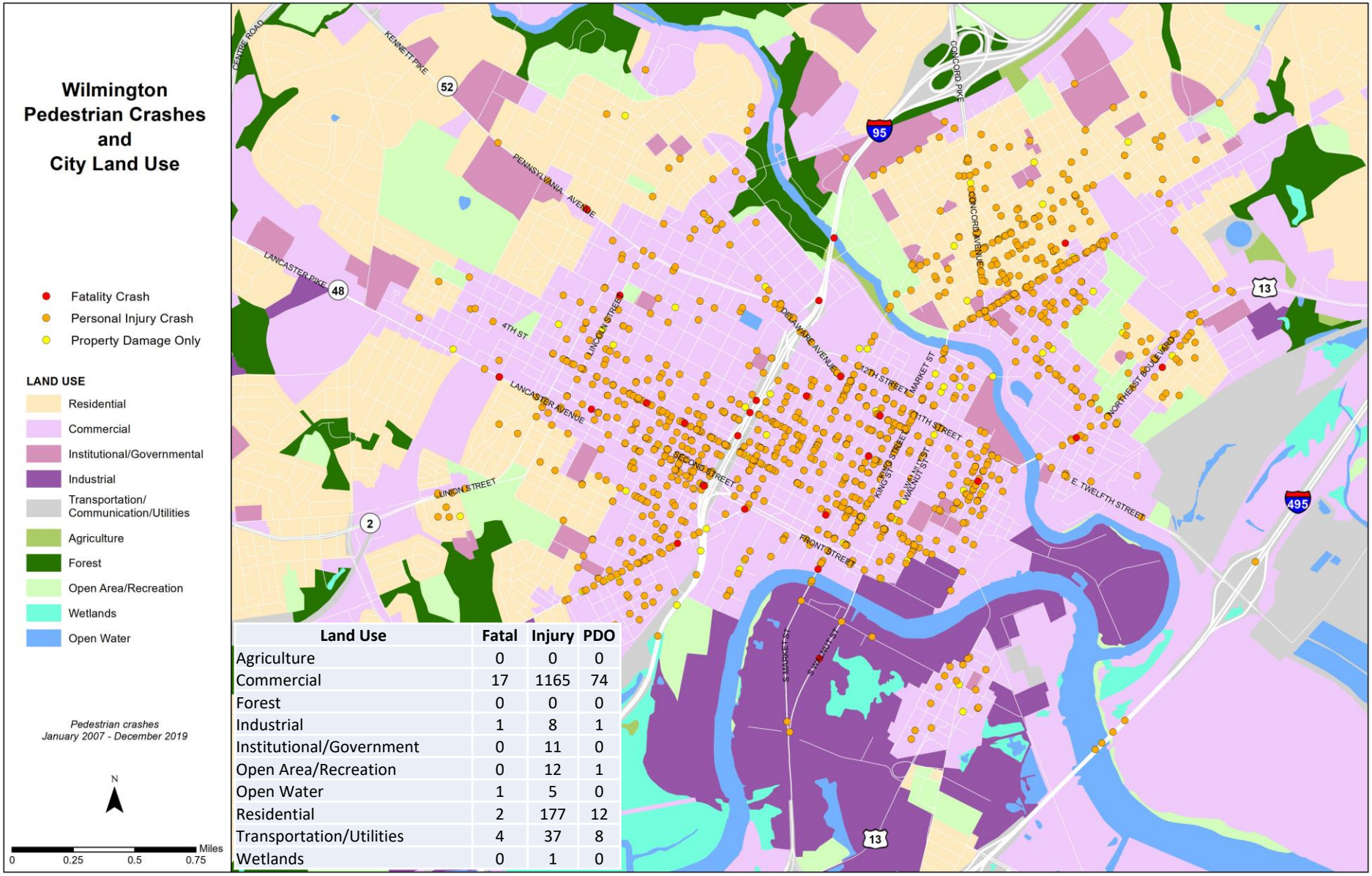
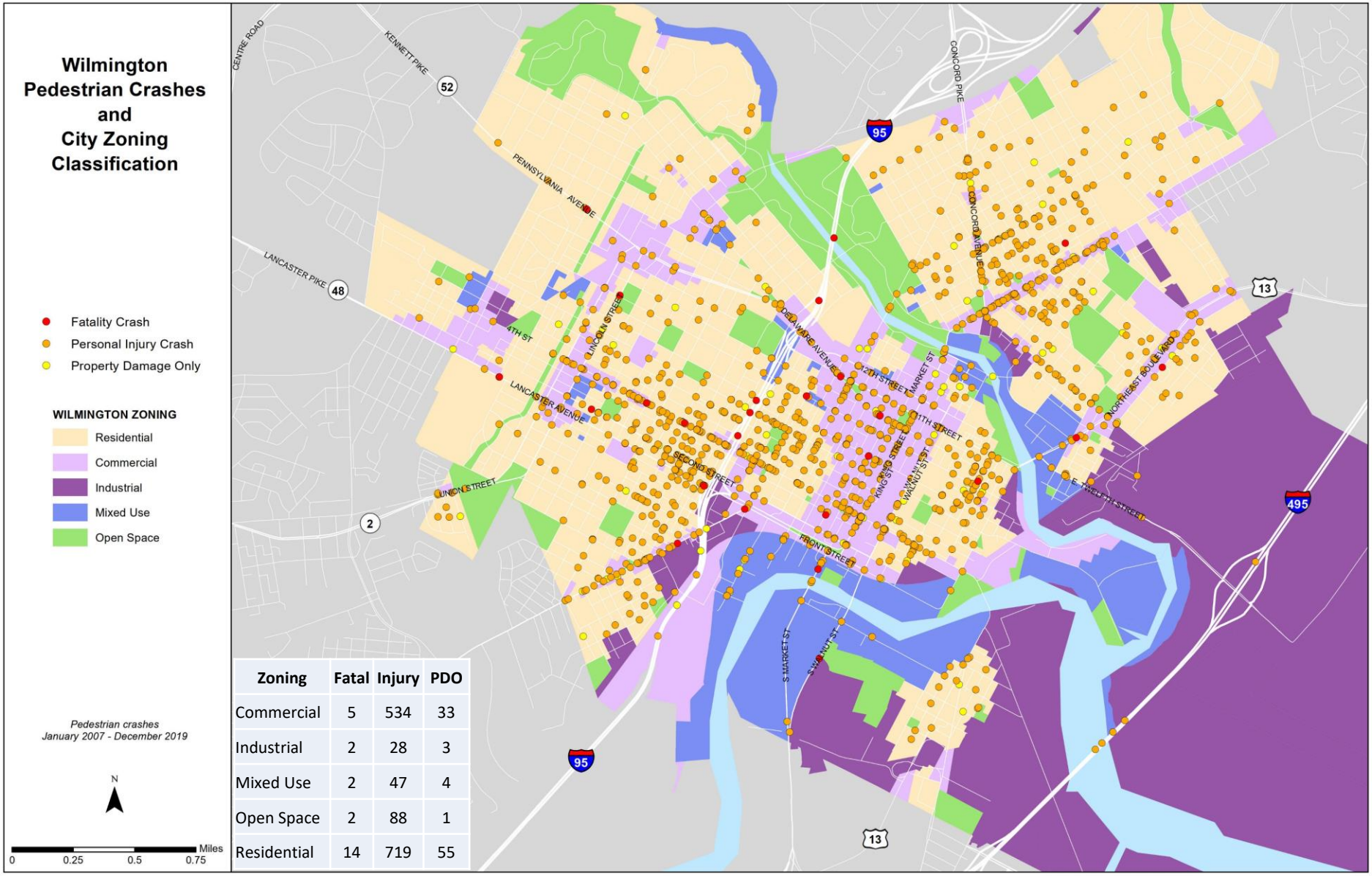


Land Use	Fatal	Injury	PDO
Agriculture	0	0	0
Commercial	17	1165	74
Forest	0	0	0
Industrial	1	8	1
Institutional/Government	0	11	0
Open Area/Recreation	0	12	1
Open Water	1	5	0
Residential	2	177	12
Transportation/Utilities	4	37	8
Wetlands	0	1	0

Pedestrian Crashes – Where?



Zoning	Fatal	Injury	PDO
Commercial	5	534	33
Industrial	2	28	3
Mixed Use	2	47	4
Open Space	2	88	1
Residential	14	719	55

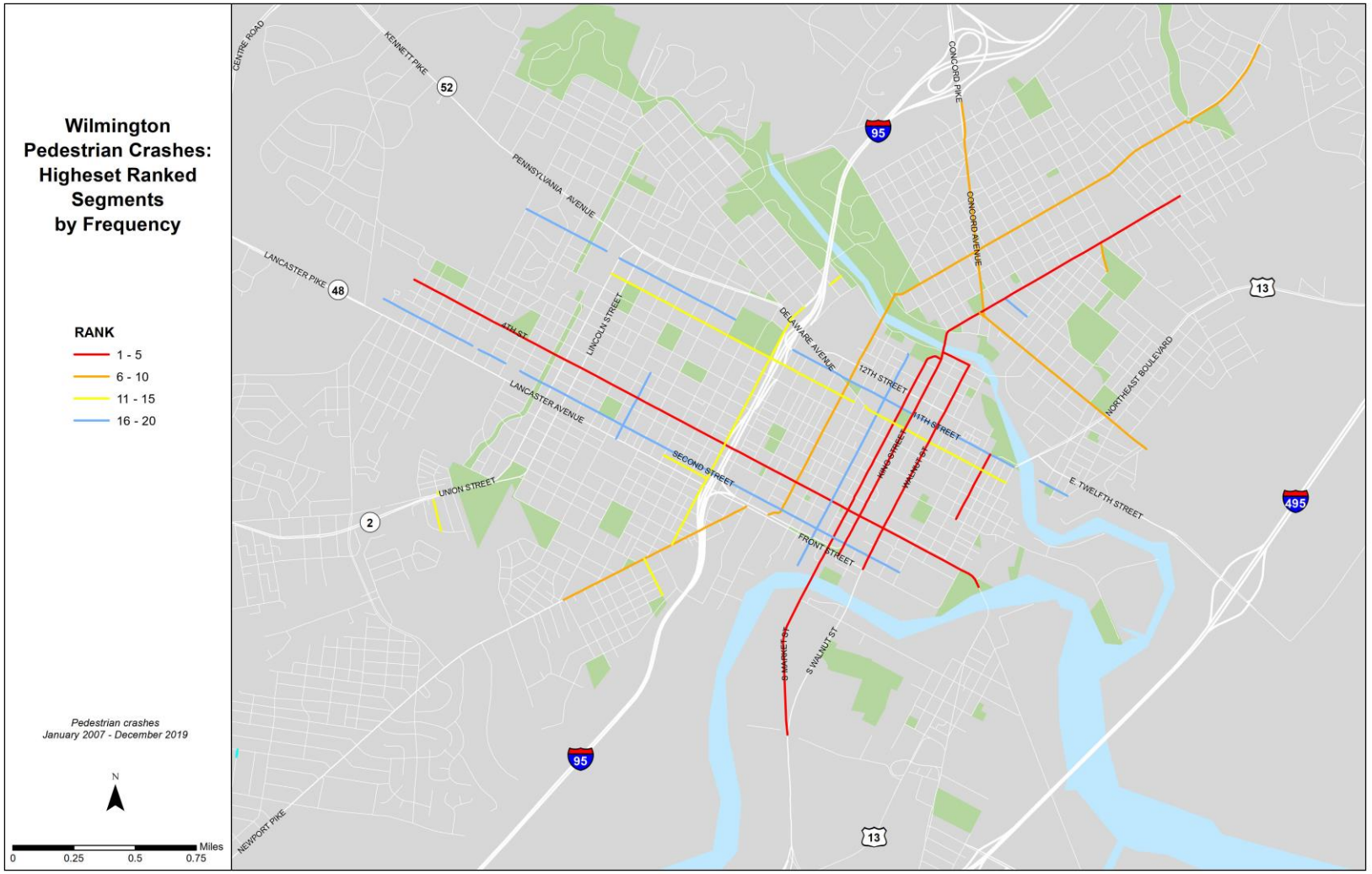
Pedestrian Crashes – Where?

- Top 20 roadways ranked by crash rate (Crashes/mile)

Rank	Roadway Name	Segment Length	# Crashes	Fatal Crashes	Injury Crashes	PDO Crashes	Crashes/Mile
1	King St.	0.94	93	0	88	5	99.31
2	W. 4th St.	2.64	198	2	188	8	75.11
3	Kirkwood St.	0.30	15	1	12	2	50.29
4	Walnut St.	1.06	51	0	47	4	47.96
5	S. Market St.	2.96	123	1	120	2	41.55
6	E. Newport Pike	0.84	34	2	26	6	40.52
7	Concord Ave.	0.88	34	0	32	2	38.48
8	Danby St.	0.12	4	0	4	0	33.44
9	Vandever Ave.	0.88	29	0	29	0	32.91
10	Washington St.	2.91	95	0	89	6	32.69
11	Jackson St.	1.18	38	1	33	4	32.34
12	W. 10th St.	1.78	55	1	49	5	30.85
13	Lower Oak St.	0.17	5	0	4	1	29.95
14	Pleasant St.	0.20	6	0	6	0	29.88
15	Seneca Rd.	0.14	4	0	3	1	28.88
16	2nd St.	2.29	64	1	59	4	27.95
17	Delamore Place	0.30	8	0	8	0	26.36
18	Gordon St.	0.12	3	0	3	0	25.84
19	11th St.	2.06	52	0	52	0	25.26
20	Orange St.	0.96	24	1	23	0	25.00

Pedestrian Crashes – Where?

- Top 20 roadways ranked by crash rate (Crashes/mile)



Pedestrian Crashes – Where?

- 20 highest ranked intersections with pedestrian crashes (Crash Severity Index*)

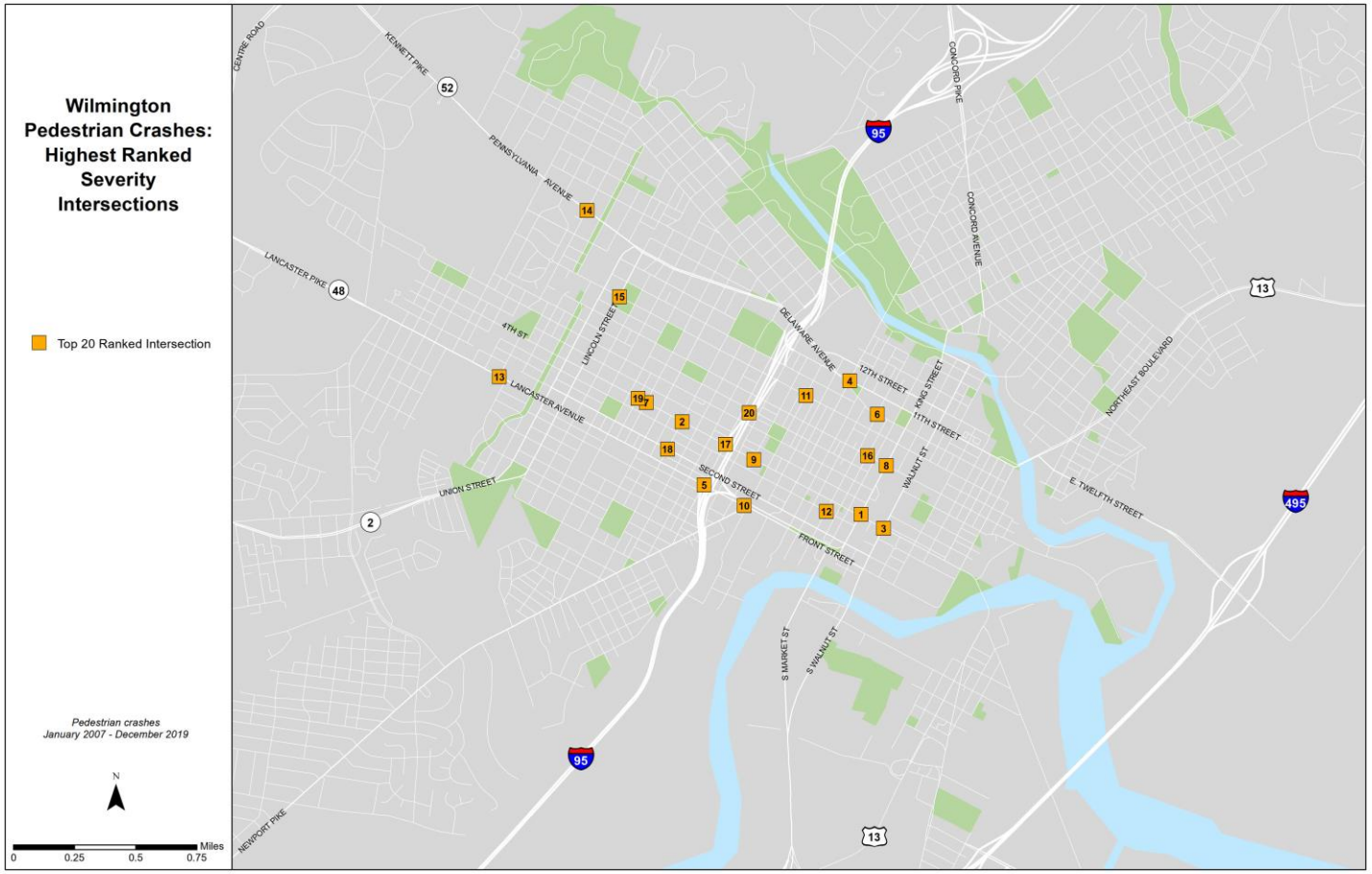
Rank	Intersection	Signalized?	Fatal Crashes	Injury Crashes	PDO	Total Crashes	Crash Severity Index
1	King St. @ 4th St.	YES	0	27	3	30	124.5
2	4th St. @ Franklin St.	YES	1	12	0	13	94
3	Walnut St @ 4th St.	YES	0	18	1	19	82
4	11th St. @ Washington St.	YES	0	14	0	14	63
5	Lancaster Ave. @ Jackson St.	YES	1	5	0	6	62.5
6	10th St. @ Orange St.	YES	1	5	0	6	62.5
7	4th St. @ Rodney St.	YES	1	4	1	6	59
8	8th St. @ King St.	YES	0	12	0	12	54
9	4th St. @ Monroe St.	YES	0	11	0	11	49.5
10	Maryland Ave./MLK Blvd. @ Lancaster Ave./Madison St.	YES	1	2	0	3	49
11	9th St. @ Madison St.	NO	1	2	0	3	49
12	Orange St. @ 3rd St.	NO	1	2	0	3	49
13	Lancaster Ave. @ Woodlawn Ave.	YES	1	1	0	2	44.5
14	Pennsylvania Ave. @ Woodlawn Ave.	YES	1	1	0	2	44.5
15	9th St. @ Lincoln St.	YES	1	1	0	2	44.5
16	8th St. @ Shipley St.	YES	1	0	1	2	41
17	4th St. @ N. Jackson St.	YES	0	9	0	9	40.5
18	2nd St. @ Franklin St.	YES	0	9	0	9	40.5
19	4th St. @ Delamore Place	NO	0	9	0	9	40.5
20	I-95NB off-ramp to DE 52	NO	1	0	0	1	40

***Crash Severity Index = Fatal Crashes x 40 + Injury Crashes x 4.5 + PDO Crashes x 1**

Based on UD Research Project

Pedestrian Crashes – Where?

- 20 highest ranked intersections with pedestrian crashes (Crash Severity Index*)



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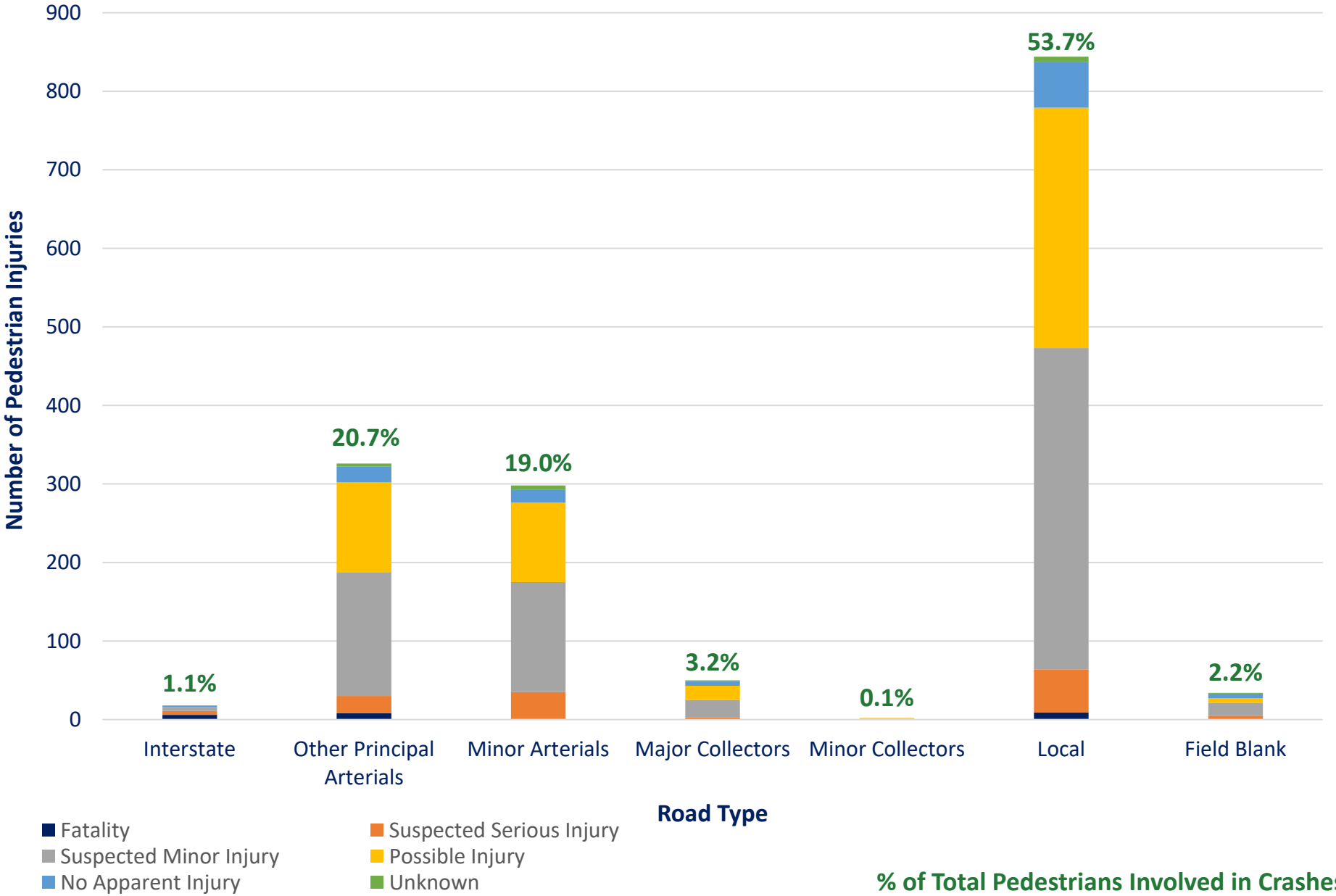
Based on UD Research Project

Pedestrians – Where?



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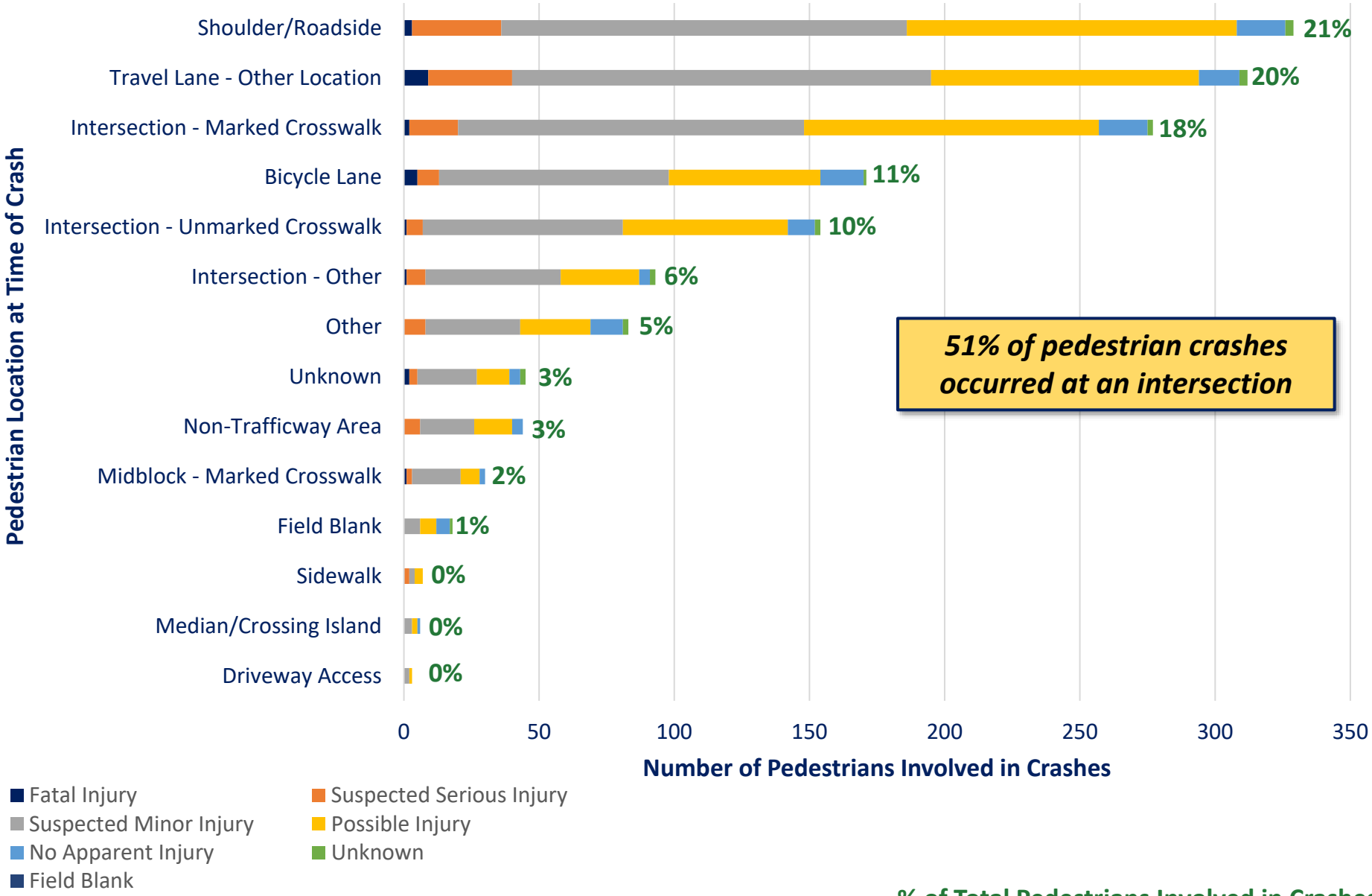
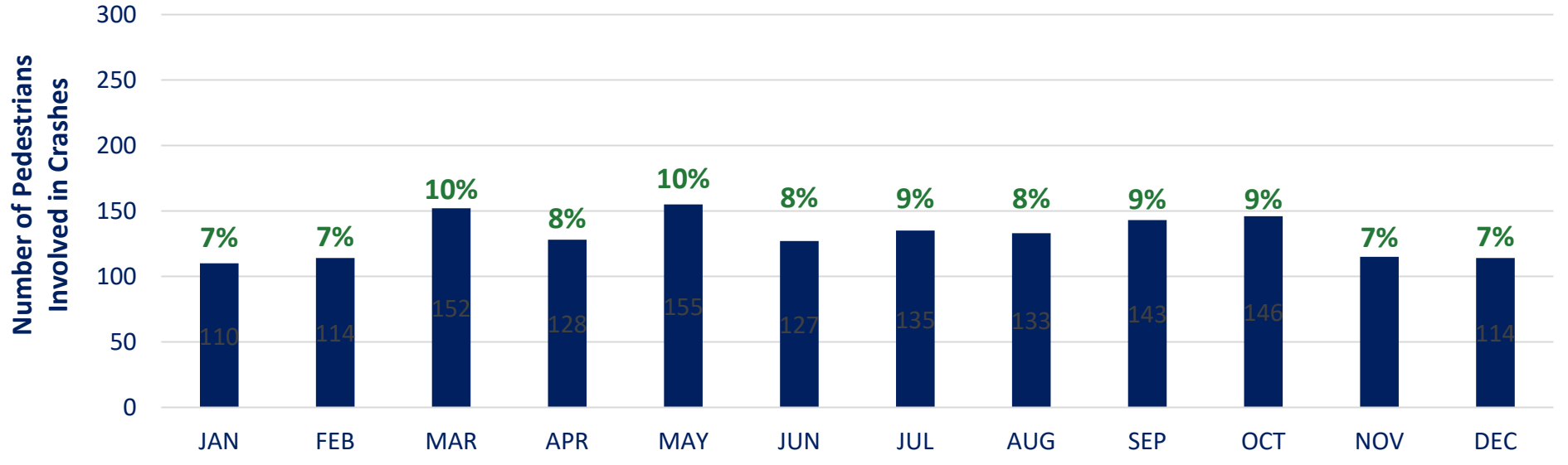
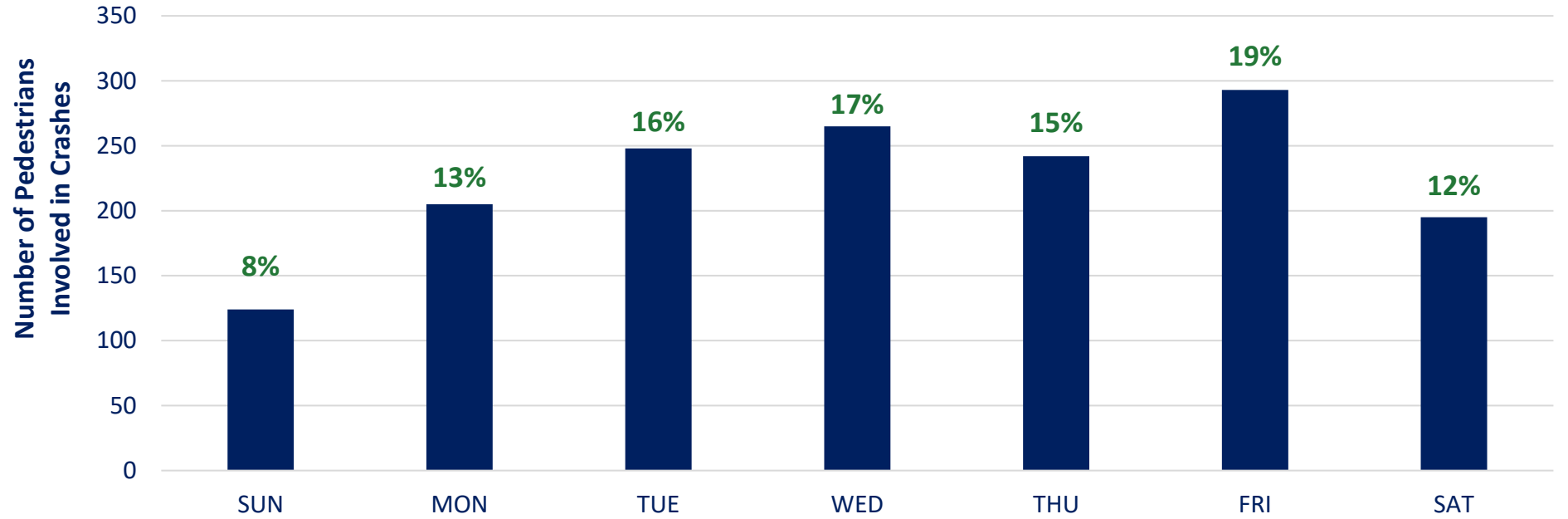


Pedestrians – When?

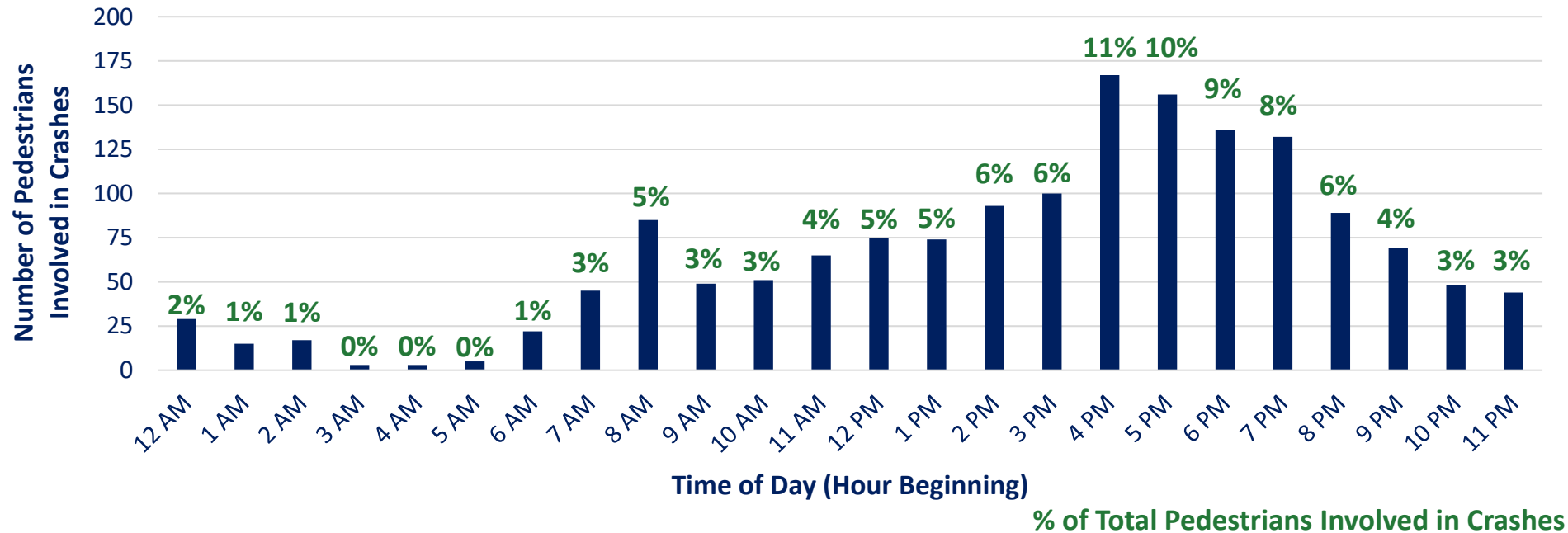




Pedestrians – When?

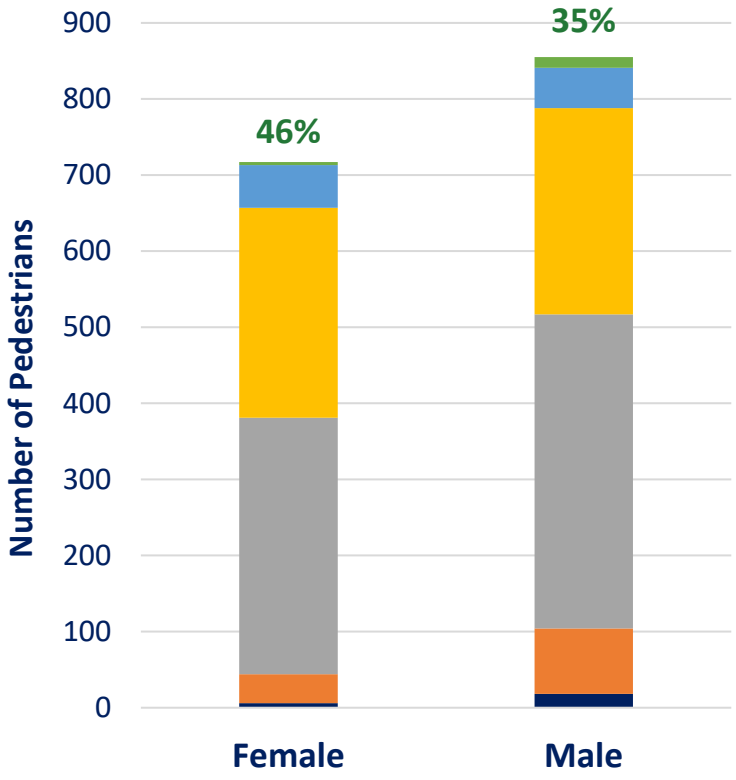
	12A	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12P	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P	Totals
Sunday	5	5	10	2			2	2	2	2	2	4	4	5	9	9	10	14	14	12	5	4	1	1	124
Monday	2	2	1			3	3	9	16	4	9	7	8	15	13	14	17	20	16	16	12	13	3	2	205
Tuesday	5	4	2		2	1	4	6	9	14	9	13	9	11	17	13	26	23	17	19	18	10	6	10	248
Wednesday	1		2		1		3	8	22	10	4	13	8	13	17	17	40	29	26	14	10	11	11	5	265
Thursday	3						4	12	18	3	9	20	20	5	15	11	25	23	19	21	14	7	7	5	241
Friday	7	2	1				4	7	15	10	11	4	19	17	12	20	34	27	33	18	16	12	11	14	294
Saturday	6	2	1	1		1	2	1	3	6	7	4	7	8	10	16	15	20	11	32	14	12	9	7	195
Totals	**29**	**15**	**17**	**3**	**3**	**5**	**22**	**45**	**85**	**49**	**51**	**65**	**75**	**74**	**93**	**100**	**167**	**156**	**136**	**132**	**89**	**69**	**48**	**44**	**1572**

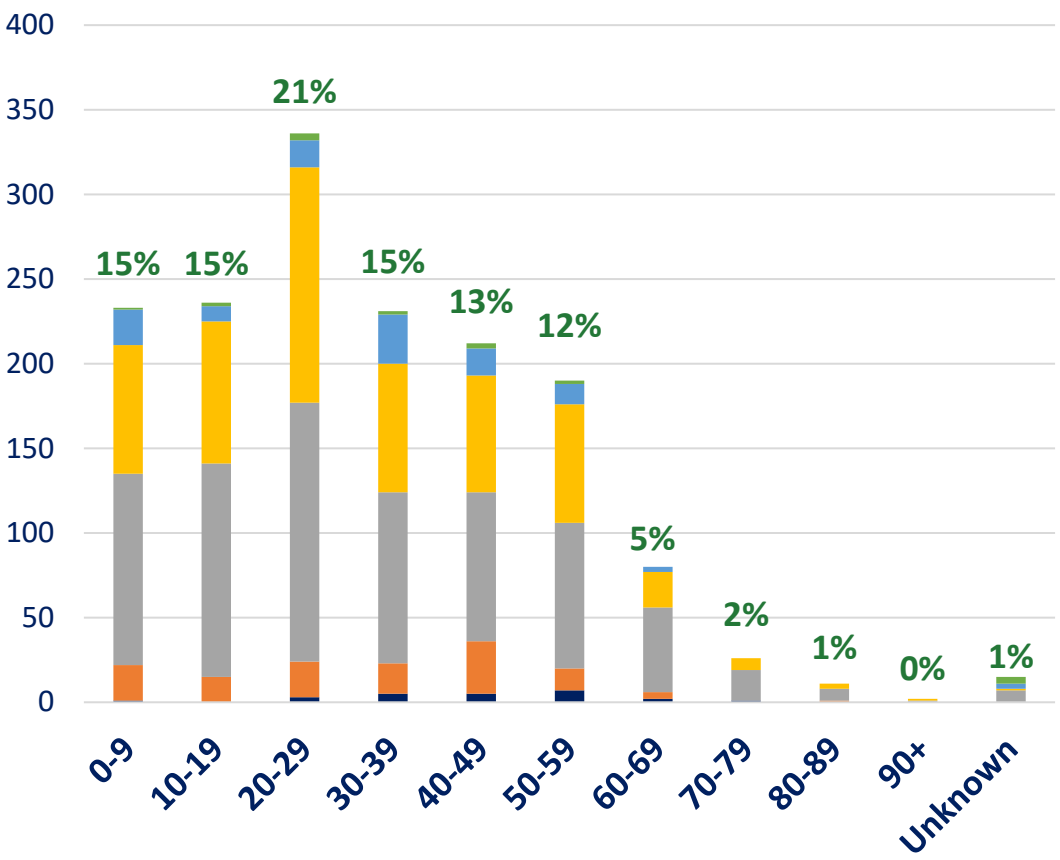
Lower Frequency *Higher Frequency* XX Number of Pedestrians Involved in Crashes



Pedestrians – Who?

3% of all pedestrians involved in crashes were impaired pedestrians

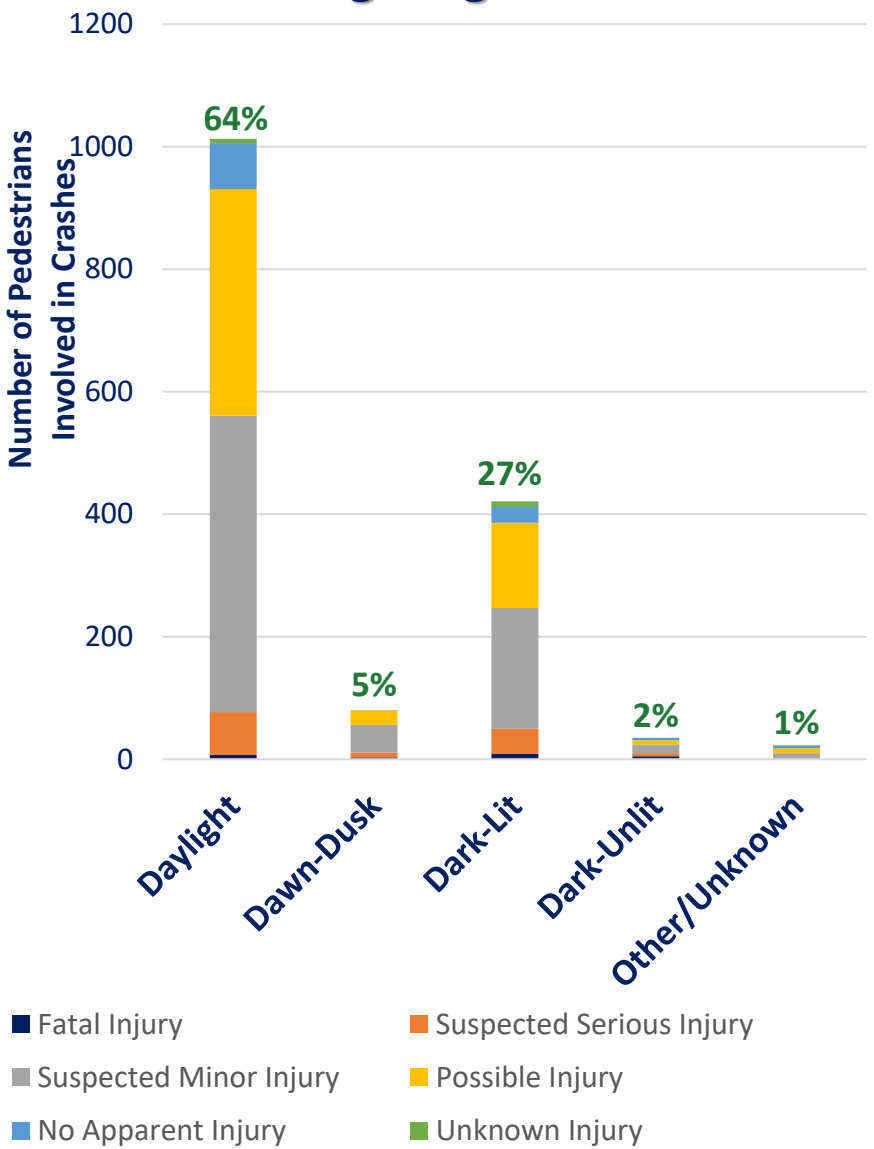




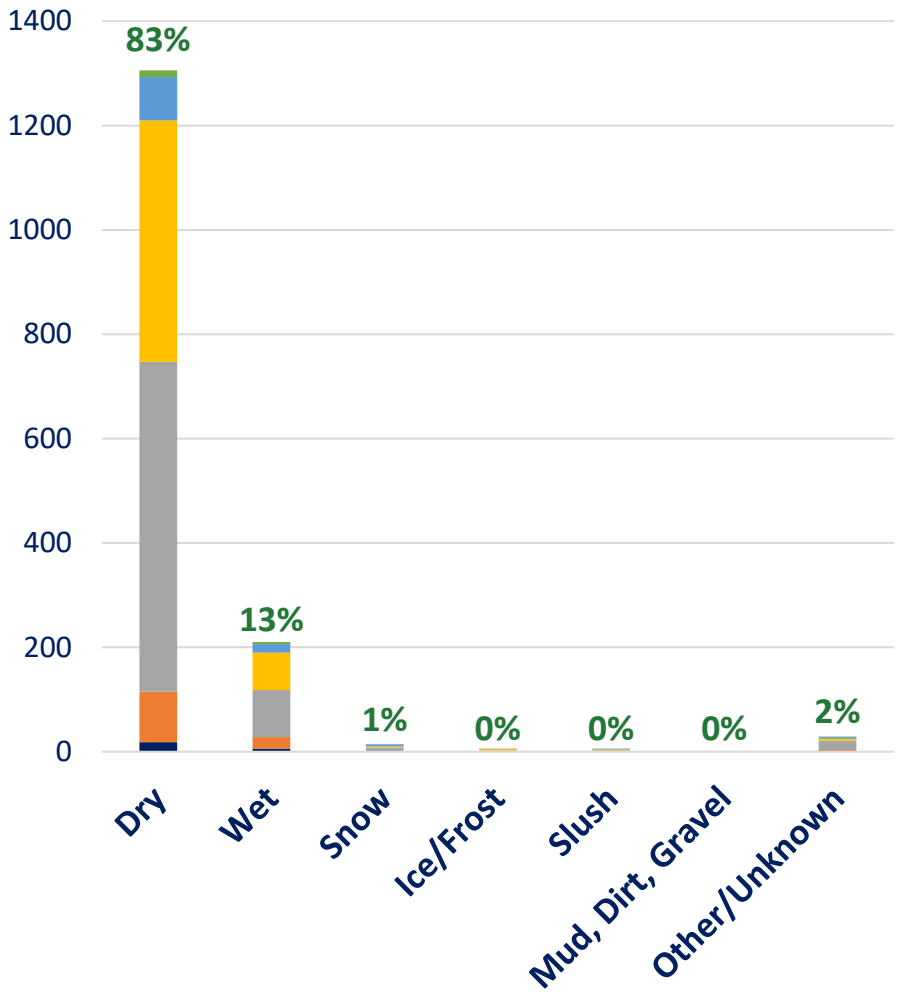
% of Total Pedestrians Involved in Crashes

Pedestrians – Crash Conditions

Lighting Conditions

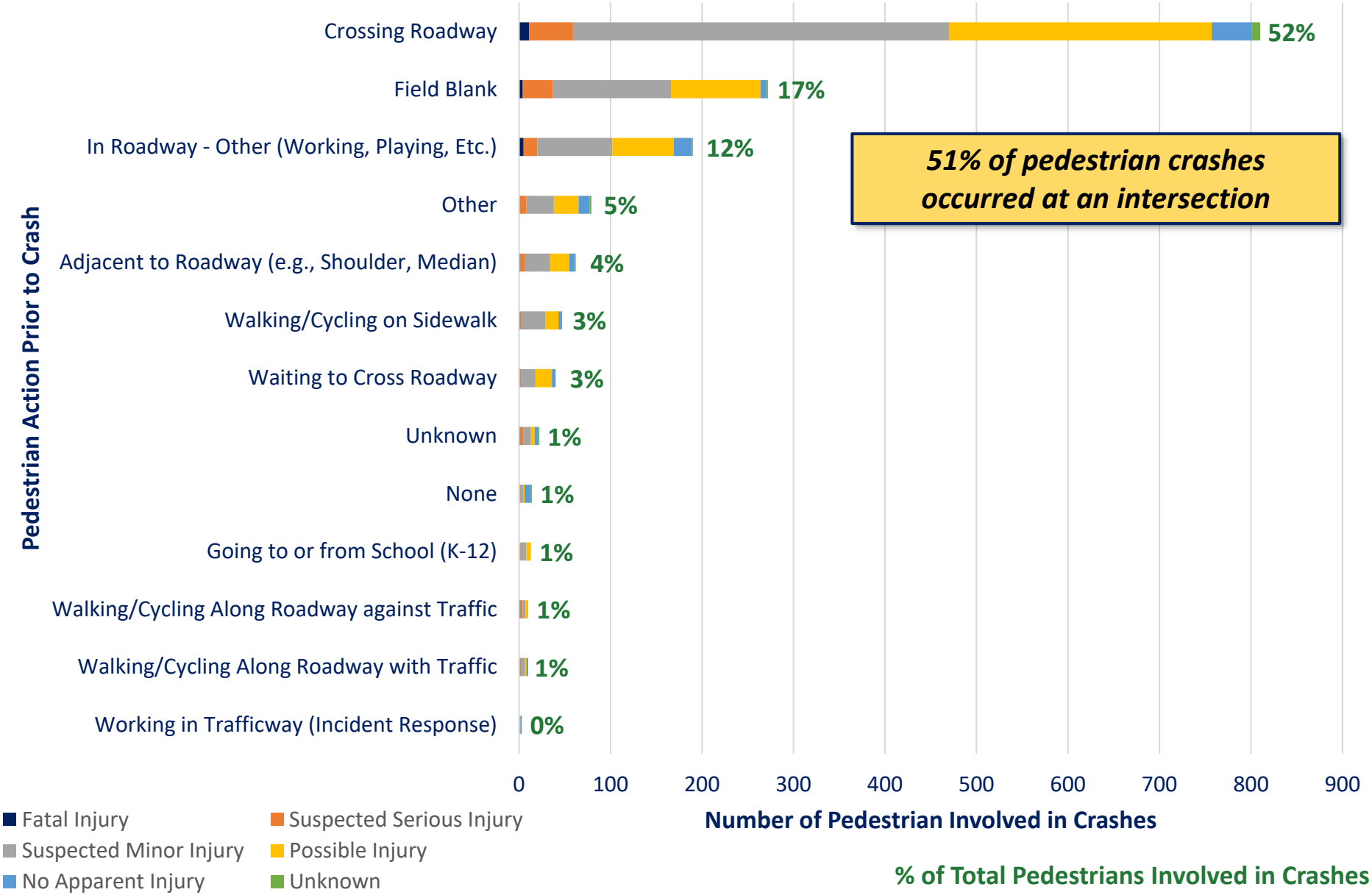


Surface Conditions

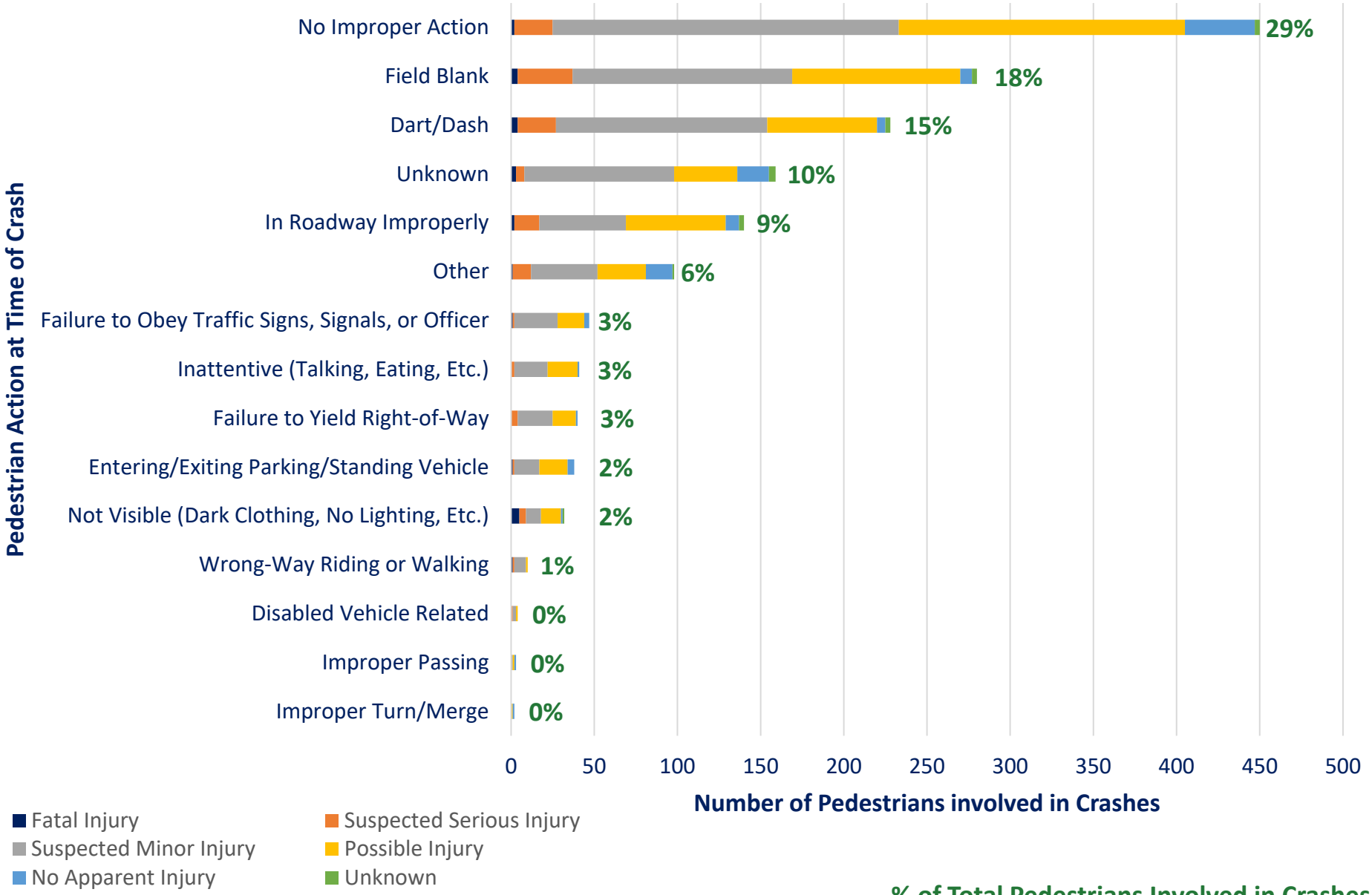


% of Total Pedestrians Involved in Crashes

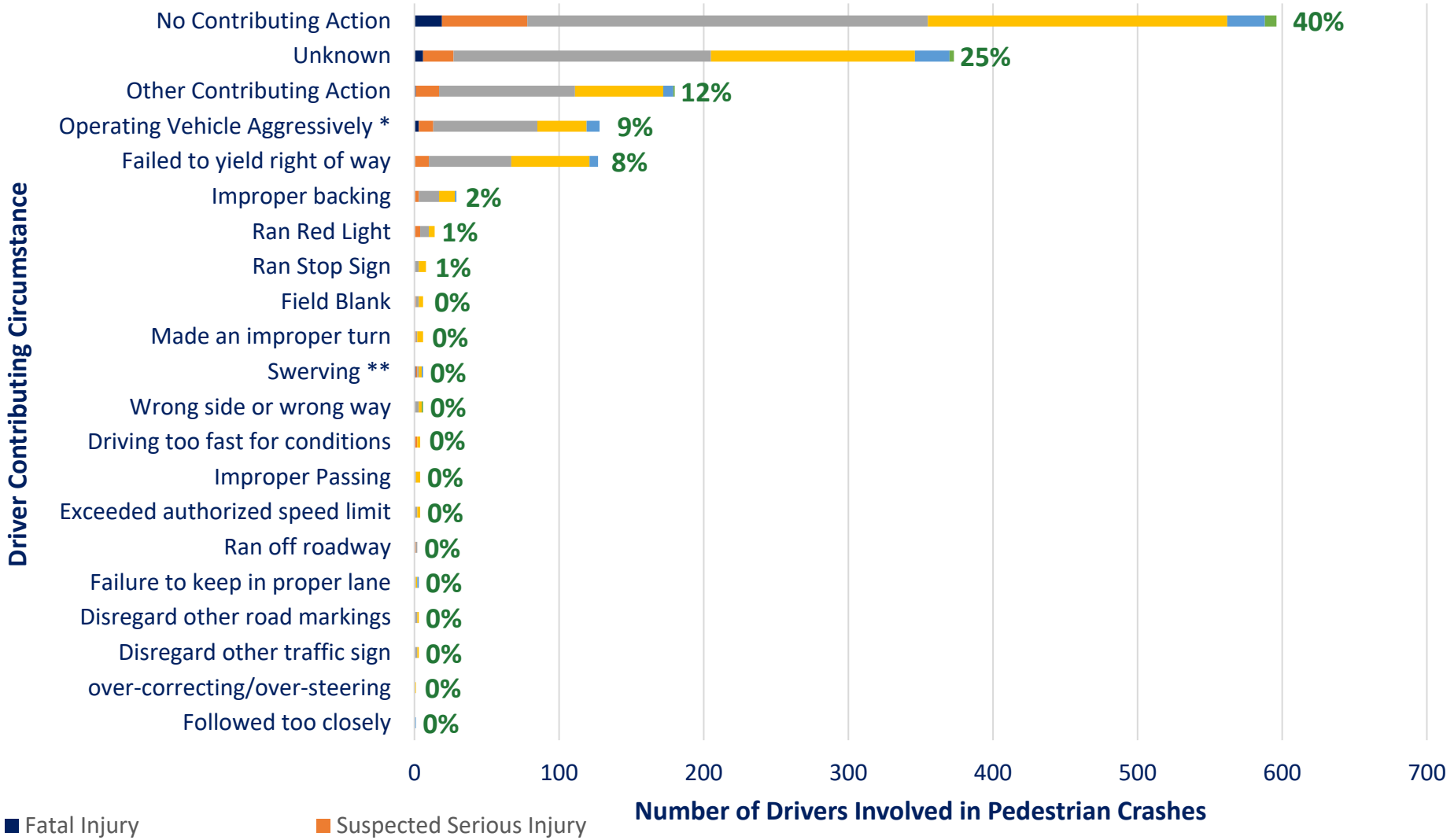
Pedestrians – Action Prior to Crash



Pedestrians – Action at Time of Crash



Pedestrians – Driver Contributing Circumstance



% of Total Drivers Involved in Pedestrian Crashes

** Operating vehicle in erratic, reckless, careless, negligent or aggressive manner*

*** Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.*

Pedestrian Crash Trends

Attribute	% Pedestrians Involved in Crashes
% fatal and serious injuries	9%
% minor and possible injuries	83%
% intersection related	51%
% occurring between 4PM and 7PM	38%
% male	54%
% pedestrian age 20-29	21%
% pedestrian age 0-9	15%
% occurring during dark (unlit) conditions	2%
% involving a pedestrian crossing the roadway	52%
% involving no contributing action on the part of the driver	40%
% involving a pedestrian darting or dashing into the roadway	15%
% pedestrians that were impaired	3%

POTENTIAL RECOMMENDATIONS AND NEXT STEPS

Potential Recommendations

- Complete pedestrian road safety audits along the corridors with high rates of pedestrian crashes
  - Top 5
- Complete studies at the intersections with high numbers of pedestrian crashes
  - Top 10
- Identify active projects for implementation of improvements where appropriate
- Work with Office of Highway Safety on targeted outreach
  - Stakeholders within the City
  - Focus on over-represented age and gender groups
- Identify systemic countermeasures for implementation
  - Ideas will be identified/vetted during the corridor and intersection studies
  - Focus on intersections
  - Focus on risk factors identified by the data

Pedestrian Safety Audits

- Location specific pedestrian safety audits are recommended to better understand specific pedestrian crash trends
  - Select locations based on segment and intersection rankings presented previously
  - Utilize a multidisciplinary team to perform the audit and make recommendations
  - Audits are typically led by DelDOT's Traffic Section
  - Implement recommendations as part of existing or future projects and programs

Pedestrian Safety Audit Process

- Review location-specific pedestrian & bicycle crash history at selected site
- Perform pedestrian observations & counts
  - Consider use of “big data” such as Streetlight to better inform audit team about pedestrian movements in the City
- Compile existing data
  - Pedestrian facilities: sidewalk, pedestrian signals, etc.
  - Bus stop locations and ridership data
  - Roadway facilities: channelization, lighting, etc.
  - Vehicular and pedestrian volumes
- Perform additional analysis to evaluate potential improvements (short and long-term)
- Present suggested improvements to stakeholders for concurrence
  - Likely a virtual meeting
  - Obtain stakeholder feedback

Suggested Stakeholders

- DelDOT (Traffic is lead)
- Office of Highway Safety
- Delaware State Police
- City of Wilmington Police
- City of Wilmington Transportation
- FHWA
- Bike Delaware
- WILMAPCO
- University of Delaware

Suggested Pedestrian Safety Audit Locations

- Road Segments (top 5)
  - King Street
  - W. Fourth Street
  - Kirkwood Street
  - Walnut Street
  - S. Market Street
  - *N. Market Street (as recommended from 2019 HEP)*
- Intersections (top 10)
  - King St. @ 4th St.
  - 4th St. @ Franklin St.
  - Walnut St. @ 4th St.
  - 11th St. @ Washington St.
  - Lancaster Ave. @ Jackson St.
  - 10th St. @ Orange St.
  - 4th St. @ Rodney St.
  - 8th St. @ King St.
  - 4th St. @ Monroe St.
  - Maryland Ave./MLK Blvd. @ Lancaster Ave./Madison St.

Potential Systemic Treatments

- Review and update pedestrian clearance times at signalized intersections
- Install TURNING VEHICLE YIELD TO PED signs (R10-15) at signalized intersections where RTOR or LTOR is permitted
- Refresh painted crosswalks
- Clear corner sight obstructions
- No parking signage/curb painting at intersections
- Install pedestrian signals at signalized intersections where they don't already exist
- Curb bump outs to decrease crossing distances
- Pedestrian crossing warning signage at unsignalized intersections

Next Steps

- Complete pedestrian road safety audits along the corridors with high rates of pedestrian crashes
  - Top 5 from road segment list
- Complete studies at the intersections with high numbers of pedestrian crashes
  - Top 10 from intersections list
- Identify active projects for implementation of improvements where appropriate
- Work with Office of Highway Safety on targeted outreach
  - Stakeholders within the City
  - Focus on over-represented age and gender groups
- Prepare implementation plan for systemic treatments
  - Ideas will be identified/vetted during the corridor and intersection studies
  - Focus on intersections
  - Prioritize based on calculated crash severity index

Thank you!

Questions & Answers

City of Wilmington Pedestrian Safety Study

January 2021